



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,534	01/10/2002	Homer Chou	00044X215193	6245

29050 7590 04/29/2005

STEVEN D WESEMAN, ASSOCIATE GENERAL COUNSEL, IP
CABOT MICROELECTRONICS CORPORATION
870 NORTH COMMONS DRIVE
AURORA, IL 60504

EXAMINER

VINH, LAN

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 04/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,534

Applicant(s)

CHOU ET AL.

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/1/2005 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is indefinite because although claim 1 is directed to a apparatus claim, the limitations of "ammonium oxalate" and "a hydroxyl coupling agent" are directed to the material/composition. It is noted that according to MPEP 2115, MATERIAL OR ARTICLE WORKED UPON DOES NOT LIMIT APPARATUS CLAIMS "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not

Art Unit: 1765

impart patentability to the claims." In re Young, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

Claims 2-27 are indefinite because they depend on claim 1

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8, 10-13, 15-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Chopra et al (US 6,419,554)

Motorani discloses an aqueous dispersion composition and a polishing system for CMP a substrate. The polishing system includes water/liquid carrier (col 2, lines 55-57), a polishing pad and abrasive (col 10, lines 21-23; col 3, lines 49-50), a hydroxyl coupling agent (col 4, lines 30-36). Motorani also discloses that the aqueous dispersion composition for CMP contains no oxidizing agent (col 6, lines 58-60) and various additives can be included in the composition (col 7, lines 5-6)

Unlike the instant claimed invention as per claim 1, Motorani fails to disclose using ammonium oxalate in the aqueous dispersion composition

Chopra discloses a method for using a planarizing solution comprises the step of using ammonium oxalate in a aqueous polishing composition (col 6, lines 5-10)

Art Unit: 1765

Since Motorani is directed to a polishing system for polishing metal using an aqueous dispersion composition that includes additive, one skilled in the art at the time the invention was made would have found it obvious to modify Mororani composition by adding ammonium oxalate in the aqueous dispersion composition as per Chopra because Chopra discloses that preferred etching agent such as ammonium oxalate is reducing agent which complex the metal to facilitate removal (col 6, lines 1-9)

Unlike the instant claimed invention as per claim 5, Motorani fails to disclose using a fixed abrasive polishing pad

Chopra also discloses using a fixed abrasive polishing pad (col 5, lines 60-62)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani polishing system by using a fixed abrasive polishing pad as per Chopra because Chopra discloses that using fixed abrasive polishing pad permits CMP removal of TiN/metal regardless of the format of the planarizing machine (col 8, lines 27-30)

The limitations of claims 2-4, 6 have been discussed above

Regarding claims 7-8, Motorani discloses using silica as abrasive (Table 1)

Regarding claims 10-12, Motorani discloses using benzotriazole in the aqueous dispersion composition (col 6, lines 4-5)

Regarding claim 13, Motorani discloses using a silane-containing compound (col 4, lines 31-34)

Regarding claim 16, Motorani discloses that the pH of the composition is 1-9 (col 6, lines 30-31)

Art Unit: 1765

Regarding claims 17-18, 20-24, 26-27, Motorani discloses polishing a substrate comprises Cu, Ta and TEOS wherein the Cu:TEOS removal rate is approximately 0.56/1:2 (Table 1)

5. Claims 9, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Chopra et al (US 6,419,554) and further in view of Allman et al (US 6,541,383)

Motorani as modified by Chopra et al has been described above. Unlike the instant claimed invention as per claims 9, 14, Motorani and Chopra fail to specifically using ureidopropyltrimethoxylane as the hydroxyl agent

Allman discloses a method for polishing a semiconductor wafer comprises the step of using ureidopropyltrimethoxylane in the aqueous polishing composition (col 7, lines 30-34)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani and Chopra by using ureidopropyltrimethoxylane in the aqueous polishing composition as per Allman because Allman discloses that organofunctional silane such as ureidopropyltrimethoxylane can be utilized as adherence promoting ligands in the polishing composition (col 7, lines 10-13)

6. Claims 19, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Chopra et al (US 6,419,554) and further in view of Ni (US 6,503,766)

Art Unit: 1765

Motorani as modified by Chopra et has been described above. Unlike the instant claimed invention as per claims 19, 25, Motorani and Chopra fail to disclose the specific removal rate ratio of the Cu and Ta layer

Ni, in a method for CMP, discloses that a polishing rate can be optimized by adjusting a polishing parameter such as polishing agent flow (col 6, lines 3-7)

Thus, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani and Chopra by adjusting the polishing agent flow to optimize the removal rate because Ni discloses that the polishing rate is a result-effective variable in the same field of endeavor

Response to Arguments

7. Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'V. Lee' or similar, written in a cursive style.

LV
April 26, 2005